



PATENT
Attorney Docket No.: 16869S-104500US
Client Ref. No.: W1380-01EY

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

KEI TAKEDA et al.

Application No.: 10/771,113

Filed: February 2, 2004

For: METHOD FOR ANALYZING
PERFORMANCE
INFORMATION

Customer No.: 20350

Examiner: Unassigned

Technology Center/Art Unit: 2184

Confirmation No.: 2029

**PETITION TO MAKE SPECIAL FOR
NEW APPLICATION UNDER M.P.E.P.
§ 708.02, VIII & 37 C.F.R. § 1.102(d)**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is a petition to make special the above-identified application under MPEP § 708.02, VIII & 37 C.F.R. § 1.102(d). The application has not received any examination by an Examiner.

(a) The Commissioner is authorized to charge the petition fee of \$130 under 37 C.F.R. § 1.17(i) and any other fees associated with this paper to Deposit Account 20-1430.

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(b) All the claims are believed to be directed to a single invention. If the Office determines that all the claims presented are not obviously directed to a single invention, then Applicants will make an election without traverse as a prerequisite to the grant of special status.

(c) Pre-examination searches were made of U.S. issued patents, including a classification search and a key word search. The classification search was conducted on or around September 8, 2004 covering Class 345 (subclasses 440, 733, 734, and 753), Class 702 (subclass 186), Class 707 (subclass 205), Class 709 (subclasses 219, 220, 223, 224, 225, and 230), Class 711 (subclass 111), and Class 714 (subclasses 25 and 47), by a professional search firm, Lacasse & Associates, LLC. The key word search was performed on the USPTO full-text database including published U.S. patent applications. The inventors further provided a reference considered most closely related to the subject matter of the present application (see reference #7 below), which was cited in the Information Disclosure Statements filed on February 2, 2004.

(d) The following references, copies of which are attached herewith, are deemed most closely related to the subject matter encompassed by the claims:

- (1) U.S. Patent No. 6,466,973 B2;
- (2) U.S. Patent Publication No. 2003/0093619 A1;
- (3) U.S. Patent Publication No. 2003/0200347 A1;
- (4) U.S. Patent Publication No. 2003/0204583 A1;
- (5) U.S. Patent Publication No. 2004/0059807 A1;
- (6) U.S. Patent Publication No. 2004/0061701 A1; and
- (7) U.S. Patent Publication No. 2003/0005119 A1.

(e) Set forth below is a detailed discussion of references which points out with particularity how the claimed subject matter is distinguishable over the references.

A. Claimed Embodiments of the Present Invention

The claimed embodiments relate to a system and a method for displaying/analyzing performance information of servers and storage devices and, more particularly, a technique to facilitate the discrimination of a server group that is causing I/O contention on a resource in a storage device and a portion that has become a bottleneck in performance.

Independent claim 1 recites a performance information display method using a computer, comprising the steps, in the computer, of reading out information data of a storage device previously stored in a storage device and information data of a plurality of computers utilizing the storage device, both information data previously stored in a memory device; displaying a volume identifier of the storage device and identifiers of the plurality of computers utilizing the storage device on a screen on the basis of the information data read out; accepting a command to select the displayed volume identifier of the storage device; and displaying performance information data of the plurality of computers utilizing the selected volume of storage device on the basis of the accepted command and the information data read out, the performance information corresponding to the volume of the storage device being associated with the plurality of computers.

Independent claim 2 recites a performance information analysis method in a system including a storage device and a plurality of servers. The performance information analysis method comprises a server volume performance information collection step of collecting performance information data for respective volumes on respective servers; a server storage mapping information collection step of collecting identifiers of resources in the storage device utilized by the respective volumes on the respective servers; and a narrowed down server volume performance information output step of narrowing down only server volumes utilizing a specific resource in a specific storage device from the collected performance information data by using the specific resource as a key, and outputting performance information data of the server volumes narrowed down.

Independent claim 5 recites a method for executing collection and analysis of performance information by using mechanical processing in a system in which a plurality of servers share a storage device. The method comprises a storage performance information collection step of collecting performance information data of resources in the storage device; a server volume performance information collection step of collecting performance

information data for respective volumes on respective servers; a server storage mapping information collection step of collecting identifiers of resources in the storage device utilized by respective volumes on respective servers; a storage resource selection step of displaying resources within the storage device and their performance information data, and making a user arbitrarily select a resource included in the storage device; and a narrowed down server volume performance information output step of narrowing down only server volumes utilizing a specific resource within the storage device from the collected performance information data by using the specific resource as a key, and outputting performance information data of the server volumes narrowed down.

Independent claim 8 recites a performance information analysis method in a system including a storage device and a plurality of servers. The performance information analysis method comprises an intra-server volume performance information collection step of collecting performance information data for respective volumes, mounted on respective servers, corresponding to volumes in the storage device; a server storage mapping information collection step of collecting identifiers of resources in the storage device utilized by the respective volumes on the respective servers; and a narrowed down server volume performance information output step of narrowing down server volumes utilizing a specific resource in a specific storage device from the collected performance information data by using the specific resource as a key, and outputting performance information data of the volumes narrowed down.

One of the benefits that may be derived is that it is possible to easily detect concentration of I/O loads on a resource within the storage device and easily discriminate servers that burden the load. In the case where a plurality of storage devices or a plurality of servers share various devices, it becomes easy to grasp the state of a device that becomes a bottleneck in performance of the shared devices by collecting and analyzing performance information of related devices. Moreover, by displaying the performance information, it is possible to easily discriminate a server group that causes I/O contentions on a resource in the storage device or a part that becomes a bottleneck in performance.

B. Discussion of the References

None of the following references disclose or suggest accepting a command to select the displayed volume identifier of the storage device and displaying performance information data of the computers utilizing the selected volume of the storage device on the basis of the accepted command and the information data read out, the performance information corresponding to the volume of the storage device being associated with the plurality of computers. Nor do they teach or suggest the narrowed down server volume performance information output step of narrowing down only server volumes utilizing a specific resource in a specific storage device from the collected performance information data by using the specific resource as a key, and outputting performance information data of the volumes narrowed down.

1. U.S. Patent No. 6,466,973 B2

This reference discloses a method and a system for managing storage devices over a network. Discussed is at least one display function of a managed object that will be used to display a view of the managed object through the management console. Fig. 2A shows a graphical user interface 200 that is implemented to carry out storage management functions. A directory view 201 may provide a list of various systems and subsystems 202 that are coupled to a network that is in communication with a management console computer. A user may click on a system 218 to expand the physical view of the system, or view the logical elements that are being managed by the system. See Figs. 2A, 2B, and 2E; column 2, lines 60-63; column 4, lines 44-47; and column 6, lines 9-13 and lines 44-46.

2. U.S. Patent Publication No. 2003/0093619 A1

This reference discloses a management method and apparatus for storage apparatus. Discussed is a screen showing performance data of each component employed in the disk-array apparatus. A configuration window may be visually displayed showing a configuration of plurality of components in the storage system within an operation screen. The preference window may provide bandwidth utilization information of one or more components in the storage system. The system does not appear to provide for user selecting particular storage devices, although it does appear to show a system where a user may view bandwidth utilization of a storage device. See paragraphs [0011] and [0015].

3. U.S. Patent Publication No. 2003/0200347 A1

This reference relates to visualization of grid computing network status. Discussed is a method for human visualization of a status of a grid computing for a network of interconnected computers. It presents a hierarchical view of the grid status wherein status of components of the grid are grouped together by a predetermined plan and presented at first level by an icon on a high level view of the grid. If more details about status of a portion of a grid are desired, one can click on the appropriate icon which results in more detail being displayed. See paragraphs [0014] and [0015].

4. U.S. Patent Publication No. 2003/0204583 A1

This reference discloses an operation management method of capturing performance information from a plurality of modules and then displaying the performance information via a display module. Performance monitoring control module may obtain and display a mapping configuration diagram to display 490. When an administrator selects a "LOG" table on the display module, the performance monitoring control module may obtain performance information of logical volume 361 in relation to the "LOG" table and performance information of volume 161 and RAID group 151 from storage monitoring apparatus 300, and then may display the performance information obtained in the display module provided. An administrator then may be capable of detecting an area where a load is heavy. See Figs. 5, 12 and 16; and paragraph [0065].

5. U.S. Patent Publication No. 2004/0059807 A1

This reference discloses a network analysis topology detection. A method for determining network topology includes capturing and storing channelized data with a network analyzer, interleaving the channelized data into unitary data stream in chronological order, and processing the unitary data stream to extrapolate indicators of network elements. Software may display a plurality of performance metrics to the user. A GUI component 202 is generally configured to send requests to the engine 201 for data and receive the data that the engine 201 has calculated from a particular trace file and display the data to the user in one of a plurality of formats. A topology detection view may be configured to list errors and warnings, while graphically indicating a location on the network that may have caused an error or warnings. While the user does not appear to have the option of choosing storage

device information, a user may scroll and click on a particular error from the log, and the click may activate the software to link to detailed information about the node and error. See Fig. 2; and paragraphs [0014], [0039], [0064], and [0087].

6. U.S. Patent Publication No. 2004/0061701 A1

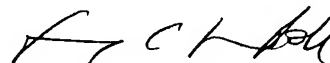
This reference discloses a method and system for generating a network monitoring display with animated utilization information. A display means includes a map or topology of a network with performance shown with movement of displayed elements, such as line segments or dashes. Legend buttons 655 may allow a user of GUI 600 to select a particular utilization category for illustration in display 610. In response to selection at 250, performance monitoring mechanism 120 may show only the selected utilization category. The reference does not specifically discuss selecting a particular type of identifier in relation to a storage device, although it does appear to embody selecting a particular identifier with a performance utilization category. See Figs. 2 and 6; and paragraphs [0012] and [0055].

7. U.S. Patent Publication No. 2003/0005119 A1

This reference discloses a method for simplifying the volume assignment in the SAN environment. The apparatus provides a simple user interface that allows operators to use pre-created policies for criteria to select data paths that meet organizations uptime and performance requirements. The apparatus uses pathing methodologies to select the optimal data path from the candidates by rating SAN state, uptime, performance, and other key factors. See Fig. 7.

(f) In view of this petition, the Examiner is respectfully requested to issue a first Office Action at an early date.

Respectfully submitted,


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Appl. No. 10/771,113
Petition to Make Special

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Attachments
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